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AN ENUMERATION OF SOME PLANTS—CHIEFLY FROM THE SEMI-TROPICAL REGIONS OF FLORIDA—WHICH ARE EITHER NEW, OR WHICH HAVE NOT HITHERTO BEEN RECORDED AS BELONGING TO THE FLORA OF THE SOUTHERN STATES. By A. W. CHAPMAN. (*Concluded from page* 12.)

Pancratium (*Hymenocallis*) *Caribaeum*, L. Bulb large, without runners? leaves broadly lanceolate, erect-spreading (1½–2 feet long, 2–3 inches wide), obtuse; scape stout, 2-edged (2–3 feet high), many-flowered; tube of the perianth rather slender (5 inches long), about as long as the linear recurved white divisions; crown funnel-shaped, entire, or with few small teeth between the filaments.—Sandy Coast of South Florida, from Tampa Bay and Southward. Flowers very fragrant.

Pancratium (*H.*) *crassiflorum*, Herb. Bulb large, with runners; leaves erect, lorate, obtuse, concavo-convex, thick and rigid (1½–2 feet long, ¾ inch wide); scape stout, glaucous, rather longer than the leaves, 2-flowered; tube of the perianth thick (3–4 inches long), shorter than the linear spreading ochroleucous divisions; crown white, large, funnel-shaped, ⅓ as long as the perianth, variously toothed between the filaments.—Low pine barrens, West Florida.

Agave rigida, Miller, var. *Sisalana*, Engelm. Caulescent; leaves long (4–6 feet), linear-lanceolate, the margins more or less spiny, the terminal spine not decurrent; scape tall (15–20 feet), leafy-bracted; panicle large, widely spreading, the clustered flowers often viviparous; corolla funnel-shaped; stamens and style exserted.—Coast of Florida, Tampa Bay and Southward.

Juncus brachycarpus, Engelm. Stem erect (1–2 feet high), mostly 2-leaved; leaves nodose; heads 2-10, spherical, densely many-flowered, pale green; sepals linear-subulate, unequal, the 3 outer ones much longer than the inner ones, and the ovoid acute 1-celled capsule; style very short.—Near Charleston, South Carolina. (*Beyrich fide Engelmann.*)

Cyperus ligularis, L. ? (not of S. Flora). Umbel many-rayed, erect; head compact, cylindrical, pedunculate, the lateral ones shorter, ovate, nearly sessile, spreading; spikelets very numerous, crowded, short (2–3 lines long), lanceolate, sub-compressed, spreading or reflexed, pale, about 7-flowered; scales membranous, ovate, acute, 7-nerved, twice as long as the obovate triangular pointed nut; rachis broadly winged; culms stout, nearly terete (2–3 feet high), glaucous, like the broadly linear rough-margined leaves, and involucre.—Punta Rassa, South Florida. November.

Cyperus purpurascens, Vahl ?=*C. ligularis*, S. Flora.

Cyperus dissitiflorus, Torr. Cyp. Umbel simple, of 3–4 erect slender rays, shorter than the 3-leaved involucre; spikelets loosely inserted along the upper portion of the rays, lanceolate, acute, compressed, 5-7-flowered; scales oblong-lanceolate, acute; nut obovate-oblong, obtusely angled in front; rachis narrowly winged; culms filiform, from a thickened base (1–2 feet high); leaves very narrow.—Mississippi (*Carpenter*), New Orleans (*Hooker, fide Torrey*).

Cyperus retrorsus, n. sp. Umbel simple, 8-rayed; heads clavate-cylindrical; spikelets lanceolate, acute, reflexed; scales 4, the third one fertile, oblong, 9-nerved, rather longer than the oblong triangular nut, the fourth lanceolate, neutral; rachis very slender, broadly winged; culms slender (2 feet high), very smooth, triangular; leaves linear; involucre longer than the umbel.—Robert's Key, Caximbas Bay, South Florida.—Near

C. retroflexus, but more slender, with shorter and thicker spikelets, and narrower heads.

Cyperus cylindricus, n. sp. Umbel 3-6-rayed, erect, simple; heads simple, cylindrical, (1–1½ inches long,); spikelets very numerous, spreading, lanceolate, 7-9-flowered; scales oblong, obtuse, 7-9-nerved, the 2 lower ones empty, the 2-3 upper ones abortive; nut acutely triangular, oblong; rachis slender, narrowly winged; culms (1–3 feet high,) triangular, smooth, as long as the broadly linear smoothish leaves; leaves of the involucre 3–6, longer than the umbel.—Collier's Key at Marco Pass, South Florida.—Near *C. cephalanthus*, Torr. and Hook.

Scirpus ? Cubensis, Poepp and Kunth. Culm acutely triangular, leafy at the base (8–10 inches high); leaves longer than the culm, linear; involucre very long, 5-leaved; spikes obovate, compressed, 12-flowered, closely packed in a compound globular sessile terminal head; scales rigid, loose, obovate-oblong, tapering to a stout spreading point, 13-nerved; stamens 3; style long, deeply 2-parted; nut ovate-lanceolate, concavo-convex, acuminate; bristles none.—New Orleans, (*Dr. Hale*).

Trichelostylis miliacea, Nees. Culm weak, compressed-4-angled (6–12 inches high); leaves straight, erect, ensiform; umbel decompound, widely spreading, many times longer than the 2 subulate leaves of the involucre; spikes small, (1 line in diameter), globular; scales oblong, obtuse, 3-nerved; nut pale, obovate, slightly roughened. (*Scirpus*, L. *Fimbristylis*, Vahl.)—Ditches, &c., Apalachicola, Florida.

Isolepis carinata, Hook and Arn. Culm setaceous (3–6 inches high), slightly compressed, furrowed, with a single setaceous leaf at the base; spike solitary, sub-lateral, ovate, 6–8-flowered; scales ovate, acute, strongly keeled, twice as long as the short acutely triangular roughish nut.—New Orleans, (*Dr. Hale*).

Leersia monandra, Swartz. Panicle nearly simple, spreading, exserted; spikelets minute, ovate, acute, compressed, glabrous; stamen solitary; culm slender (2–3 feet long), smooth; leaves broadly linear, rough above and on the margin.—South Florida, (*Herb. Thurber.*).

Pharus latifolius, L. ? Leaves oblong, acute, rough beneath, longer than the petiole-like sheath; lower palea of the pistillate spikelet acute, downy on the back, twice as long as the lanceolate glumes.—Orange Lake, Florida, (*Herb. Thurber.*).

Sporobolus purpurascens, Hamilton. Culms tall (2–3 feet) branching; leaves long, narrow-linear, slightly scabrous above, mostly hairy at the base; ligula a villous ring; panicle racemose, simple, the short spreading branches whorled; flowers short-pedicelled, smooth; glumes unequal, the upper one as long as the paleæ, twice as long as the lower one.—Wet sandy places, subject to tidal overflow. Jew-fish Key, South Florida

Muhlenbergia cæspitosa, n. sp. Culms tufted, simple (2 feet high); leaves short (4–6 inches long), narrow-linear, flat; panicle terminal, long-peduncled, sparingly branched, the straight setaceous rough branches erect; paleæ 3-nerved, bearded at the base, 4 times as long as the oval obtuse or denticulate glumes, and equalling the stout rough awn.—Dry pine barrens, near Apalachicola, Florida. July 4.—Resembles *M. trichopodes*.

Sclerachne Arkansana, Torr. Annual, low, tufted; culms erect (6–12 inches high), branching; leaves narrow, flat, pubescent, panicle contracted (2–6 inches long); glumes rigid, hispid; lower paleæ rigid, rough-awned; stamens 2.—Shell-banks, near Apalachicola, Florida. April.

Aristida simpliciflora, n. sp. Culms filiform, erect (2 feet high), sparingly branched; leaves narrow-linear; racemes simple, very slender, straight (6–9 inches long); flowers scattered, on short pedicels, single, or the lower ones by pairs; glumes nearly equal, awn-pointed (3½ lines long), the outer one longer than the paleæ; awns widely spreading, the lateral ones as long as the glumes, straight, the middle one curving in a semicircle at base.—Damp pine barrens, West Florida.

Aristida gyrans, n. sp. Cæspitose, glabrous; culms simple, filiform (1 foot high),

purple; leaves convolute-filiform, shorter than the culm; panicle simple, few-flowered, the branches short, appressed; glumes very unequal, the lower as long as the palea, truncate, short-awned, roughish; the upper ⅓ longer, attenuate, smooth; paleæ long-stipitate; awns nearly equal, straight, gyrate at base, ⅓ longer than the paleæ.—Robert's Key in Caximbas Bay, South Florida.—In wet weather the awns are staight, but immediately assume their curved form when dry, as do some other awned grasses.

Aristida scabra, Kunth. Culm very short (1–2 inches) from a creeping base; leaves numerous, long, linear, their smooth sheaths enwrapping the base of the long-peduncled panicle, this very large (1½–3 feet long), the widely spreading branches in alternate clusters of 2–5, flowers scattered, appressed; glumes awn-pointed, the lower one longer, the keel rough; awns erect, straight, the middle one many times longer than the minute lateral ones, 3–4 times longer than the glumes; stamens 2.—Dry sandy coast, West Florida. September.

Aristida condensata, n. sp. Culms rather stout, simple, erect; leaves rigid, linear, flat or concave, soon convolute, rough on the margins; panicle long-peduncled, contracted, densely many-flowered (1-1½ feet long); glumes equal, awn-pointed, rough on the keel, longer than the paleæ; awns erect, straight, nearly equal, longer than the glumes.—Dry sandy soil, West Florida.

Triplasis sparsiflora, n. sp. Annual ? culms numerous (6–12 inches high), rigid, branching; leaves short (1-3 inches), linear-subulate, the upper ones shorter than their sheaths, which are mostly longer than the internodes; racemes simple, axillary and terminal, appressed, few-flowered; spikelets 2–4-flowered (the uppermost awn-like), the flowers large, distant; glumes thin, nearly equal, the lower cleft, the upper acute, ½–⅔ as long as the spikelets; lower palea scarious, oblong, 3-nerved, ciliate on the margin, strongly bidentate, twice as long as the scabrous awn; upper palea shorter, villous on the nerves above the middle.—Sandy coast at Punta Rassa, South Florida. October.

Paspalum tristachyum, Leconte. Culms creeping; flowering branches erect, short, 1-jointed; leaves oblong-linear, obtuse, flat, ciliate (1–2 inches long); peduncles 2–4 from the long sheath of the uppermost leaf (6–12 inches long); spikes 2–4, filiform, erect or spreading; spikelets in 2 rows, oblong-ovate, acute, as wide as the slender flexuous rachis; glumes sparingly hairy, 3-nerved. (*P. barbatum*, Schultes ?)—Damp places, Apalachicola, Florida. Perennial.—Near *P. Michauxianum*, Kunth.

Paspalum conjugatum, Berg. Culm smooth, branching, slender (1½-2 feet high); leaves linear, thin; spikes 2-3, long and slender, compressed, the terminal pair conjugate; spikelets very small, in 2 rows, ovate, yellowish; the margins loosely fringed with long weak hairs, nerveless.—New Orleans, (*Dr. Hale*).

Panicum paspaloides, Pers. Culm erect; leaves linear, smooth; panicle spicate, compound; the numerous crowded branches appressed; spikelets secund, in 2-rows, ovate, acute; glumes roundish, 5-nerved, much shorter than the acute paleæ, sterile flower of 2 paleæ, triandrous.—South Florida (*Blodgett in Herb. Thurber*).

Panicum maximum, Jacq. Culms tall (6-8 feet high); leaves flat, rigid; panicle large, (1½ feet long), erect, compound; branches whorled; spikelets oblong, smooth; glumes thin, faintly 5-nerved, obtuse, the upper one as long as the paleæ, and twice as long as the ovate, acute, lower one; sterile flowers triandrous.—South Florida, (*Blodgett in Herb. Thurber*).

Panicum striatum, Lam. Culm stout (2-3 feet high), sparingly branched; leaves lanceolate, smooth, the margins rough; panicle sub-corymbose, consisting of several erect, simple racemes, 4-5 inches long; spikelets rather large, scattered, lower glume ovate, clasping, the upper and lower sterile paleæ strongly 7-nerved.—Banks of the Caloosa River, South Florida. October.

Panicum prostratum, Lam. Culms creeping; leaves short (1-2 inches long), ovate-lanceolate; panicle short (2 inches long), consisting of 5-10 simple branches; spikelets

secund, oblong-ovate, acutish; upper glume 5-nerved; sterile flower triandrous; rachis sparsely hairy.—New Orleans, (*Dr. Hale*).

Panicum amplectens, n. sp. Very glabrous; culm slender, erect, the nodes black; leaves long, linear, with setaceous tips; panicle peduncled (6-10 inches long), erect, the scattered branches single, racemose-compound; spikelets oblong-ovate, acute; glumes strongly 5-7-nerved, the lower one orbicular or reniform, clasping, ¼ as long as the upper one; sterile flower neutral.—South Florida.—Allied to *P. maximum* and *P. virgatum*.

Cenchrus strictus, n. sp. Glabrous; culm strict, erect, simple, or at length sparingly branched (2-3 feet high); leaves numerous, linear, conduplicate, the lower sheaths dilated and longer than the internodes; spike cylindrical, many-flowered; involucre cuneate and naked at the base, the 10 or 11 stout spines ciliate, longer than the 2 acute smooth spikelets; sterile flower triandrous.—West coast of Florida, Apalachicola and Southward.

Andropogon arctatus, n. sp. Culms tall (2-5 feet high), single, compressed, the erect branches forming a long simple panicle; leaves distant, linear, shaggy with long, mostly deciduous, hairs, as are also the sheaths; spikes by pairs, exserted, narrow (1-1½ inches long), rather rigid, closely 15-20-flowered; glumes rough, twice as long as the stout joints, and ½ the length of the short bent awn; pedicel of the neutral flower tipped with 2 slender glumes; hairs of the involucre few and short; stamen 1. (*A. tetrastachyus*, var. *distachyus*, S. Flora).—Low pine barrens, West Florida.

Sorghum pauciflorum, n. sp. Annual; culms branching near the base (2-3 feet high); leaves broadly linear, flat, ciliate; flowers few (6-12), in a simple raceme, the very long (2-3 inches) setaceous pedicels in whorls of 2-6, rough, spreading; glumes equal, linear, rigid, convolute, scabrous at the apex, the lower one 2-toothed, the upper one truncate; awn very long (5-6 inches), geniculate, twisted and tortuous below the middle; sterile flowers either triandrous, linear, acute, perfect, but the short style abortive, or reduced to 2 setaceous spirally twisted pedicels.—Sandy pine barrens, near Jacksonville, East Florida.—This is unlike our other species, and has the aspect of a *Stipa*.

Imperata, Cyr. ? sp. Culm erect from a creeping base (2-3 feet high), simple; lowest leaves crowded, lanceolate, flat, the throat and sheaths more or less hairy, the upper ones small and remote; panicle long peduncled, loosely racemose (3-4 inches long), white from the copious wool of the flowers, the lower branches distinct, the upper ones crowded; spikelets small, all alternate and short-pedicelled, deciduous; glumes linear, villous with long silky spreading hairs, grain free.—Banks of the Caloosa River, South Florida.—The specimens are in fruit, and all the flowers detached; and it is uncertain whether they belong to *Imperata* or *Saccharum*, or to either of them.

Aspidium unitum, var. *glabrum*, Mettenius. Fern 2-4 feet high, from a long slender black rootstock, nearly glabrous; frond ovate-lanceolate, (1½-2 feet long), pinnate, pinnæ rather rigid, lanceolate, serrately lobed, the lower ones often sterile; fruit-dots contiguous, forming a continuous zigzag intramarginal line.—South Florida, in boggy places.

Ophioglossum palmatum, Plumier. Fern epiphytic, thick, succulent, drooping, 4-10 inches long, from a tuberous woolly rootstock; frond stipitate, cuneate at base, simple, or palmately 2-6-lobed, the lobes tongue-shaped, rarely forking, reticulate-veined; spikes 1—several at the summit of the stipe, or along the basal margins of the frond (1 inch long), peduncled.—In the axils of the leaves of the Palmetto, banks of the Caloosa River, South Florida.

Lycopodium inundatum, L., var. *appressum*. Size and habit of var. *pinnatum*, but leaves thinner, all entire, those of the spike, which is scarcely thicker than its peduncle, closely appressed.—Banks of the Caloosa River (November,) and Duval County, *Curtiss*).

Lycopodium inundatum, L., var. *elongatum*. Stem creeping, sparingly branched (1½-2 feet long); leaves subulate, attenuate, entire, spreading; peduncles slender, erect or leaning (10-15 inches long), the scattered leaves narrowly subulate; those of the spike longer, spreading.—Wet banks, Apalachicola, Florida.

Lycopodium cernuum, L. Stem slender, forking near the base, the divisions arcuate-recurved, rooting at the tips, the short alternate branches forking, and terminated by the short (4-6 lines long) nodding spikes: leaves lax, about 6-ranked, linear-subulate, entire, spreading or recurved, those of the spike ovate, acuminate, the margins bristly. —Wet sandy places near Waldo, and Duval county, East Florida (*Curtiss*).

Marsilea uncinata, A. Braun. Stem long, filiform: leaflets fan-shaped, smooth, or with few scattered hairs, entire, 6-8 lines long, the slender petiole 3-6 inches long; sporecase oval, compressed, horizontal, pubescent, 2-toothed, of which the upper one is uncinate-incurved, half as long as its erect stipe.—Banks of the Mississippi below Vicksburg.

SALIX BARCLAYI ANDERS, A NATIVE OF THE NORTHERN STATES. Among the Willows of the Philadelphia Acad. Herbarium we find a folded sheet containing a miscellaneous lot of undetermined leaves and aments from Kodiak and Sitcha, collected by the late Dr. Kellogg, of the United States Coast Survey. Some of these are clearly *Salix Barclayi*, And., of which no specimens were known to be extant in American herbaria, the types of the species being preserved in "the great storehouse of the world's botany at Kew." Our interest in this species is brought nearer home since it now appears that the peculiar willow found on the lake shore near Chicago by Prof. Babcock, and which to avoid the multiplication of supposed new species was briefly mentioned in his Catalogue of the Plants of Chicago as *S. cordata*, var. *glaucophylla*, should be referred to *S. Barclayi;* or else this species, Alaskan forms and all, be reduced to a variety of *S. cordata*, of which it appears to be a robust Western modification. The leaves are broader and shorter than in *S. cordata*, with somewhat the consistency of *S. lucida*, and when young turn black in drying; the capsules are much larger; the style longer, and the pedicels (mostly concealed by the densely villous scales) though showing the ordinary variation in length are shorter than in *S. cordata*, but not so short (even in specimens from Kodiak) as described and figured by Andersson. The aments resemble those of *S. discolor*, in size and woolliness. The common form with us accords with Prof. Andersson's var. *grandifolia*. Leaves 2 inches long by an inch broad, dark green and somewhat shining above, conspicuously glaucous beneath, minutely and sharply serrulate, &c. In specimens from Alaska the leaves are rarely floccose-villous especially when young or the mid-rib at least tomentose above, but they are very variable in this respect, often quite glabrous, and some of them precisely similar to forms collected by Prof. Babcock.

It is remarkable that this Willow should not have been found at intermediate stations in the Northwest by either Richardson, Drummond, Bourgeau or Dr. Lyall, nor have we ever received it from elsewhere than the west shore of Lake Michigan, though favored by many friends in the Northern States with the Willows of their respective localities.—M. S. BEBB.

LICHENS OF SOUTHERN ILLINOIS.—Mr. J. Wolf, of Canton, collected the following Lichens in Southern Illinois in the summer of 1877:

1. *Ramalina calicaris* Fr.
2. *Usnea barbata* (L.) Fr.
3. *Parmelia saxatilis* (L.) Fr.
4. *caperata* (L.) Ach.
5. *Physcia aquila*, var. *detonsa* Tuck.
6. *pulverulenta* (Schreb.) Nyl.
7. *speciosa* (Wulf., Fr.)
8. *Nephroma lævigatum* Ach.
9. *Pannaria microphylla* (Sw.) Del.
10. *leucosticta* Tuck.

11. *crossophylla* Tuck.
12. *molybdæa*, var. *cronia* Tuck. cum fructu.
13. *Pannaria nigra* (Huds.) Nyl.
14. *Synalissa Schæreri* (Mass).
15. *Collema microphyllum* Ach.
16. *flaccidum* Ach.
17. *pulposum* (Bernh.) Ach.
18. *pustulatum* Ach.
19. *Leptogium subtile* Nyl.
20. *pulchellum* (Ach.) Nyl.
21. *myochroum*, var., *saturninum* (Dicks.) Tuck.
22. *Placodium cerinum* (Hedw.) Næg.
23. *Placodium aurantiacum* (Lightf.) Næg.
24. *ferrugineum* (Huds.) Hepp.
25. *Lecanora muralis* (Schreb.) Schær.
26. *tartarea* (L.) Ach.
27. *subfusca* (L.) Ach.
28. *cinerea* (L.) Ach.
29. *cervina f clavis* DC.
30. *Rinodina sophodes*, var. *confragosa*, Nyl.
31. *Pertusaria pertusa* (L.) Ach.
32. *globularis** Ach.
33. *Cladonia alcicornis* Fr.
34. *furcata* (Huds.) Fr.
35. *squamosa*, var. *cæspiticia* Nyl.
36. *rangiferina* (L.) Hoffm.
37. *uncialis* (L.) Fr.
38. *Biatora rufo-nigra* Tuck.
39. *parvifolia* Pers.
40. *exigua* (Chaub.) Fr.
41. *rubella* (Ehrh.) Rabenh.
42. *chlorosticta* Tuck.
43. *Lecidea enteroleuca* Ach.
44. *tessellina* Tuck.
45. *Buellia lactea* Mass.
46. *atro-alba*, var. *chlorospora* Nyl.
47. *Opegrapha vulgata* (Ach.) Nyl.
48. *Graphis scripta* (L.) Ach.
49. *Arthonia punctiformis* Ach.
50. *tædiosa* Nyl.
51. *Mycoporum pycnocarpum* Nyl.
52. *Calicium populneum*‡ De Brogn.
53. *Calicium tubiforme* Mass.—Parasitic on *Pertusaria pertusa* on rocks.
54. *Endocarpa miniatum* (L.) Schær., and var. *Manitense* Tuck.
55. *Endocarpon hepaticum* Ach.
56. *Sagedia Laureri* (Flot.) Tuck.—On rocks.
57. *Staurothele diffractella* (Nyl.) Tuck.
58. *Sagedia Cestrensis* Tuck.
59. *Verrucaria fuscella* Fr.
60. *rupestris* Schrad.
61. *Pyrenula glabrata* (Ach.) Mass.

W.

*Perhaps this species is only a form of *P. leioplaca*.

‡This species has not before been found in this country, except, perhaps, in a very scanty specimen from New Bedford. The specimen is scanty, and, perhaps, not altogether certain.

MORTALITY AMONG HICKORIES.—Being in Lisle, Illinois, in September, I was told that the hickories, the "bitternut" and the "shagbark," had been gradually dying for several years, and I saw many dead trees to confirm the statement. Has this mortality been observed to prevail extensively at the West, and has any cause been assigned for it? W.

A FEW RESPONSES TO MR. COLEMAN'S QUERY IN THE JAN. NO. OF VOL. III., PAGE 7.—*Changes in Vegetation.*—It would be a good service to vegetable biology if any who have "authentic" facts in regard to the long continued vitality of seeds, would kindly respond to Mr. Coleman's request, and communicate. I have watched for many years, and have seen no account that went beyond a mere guess. The "mummy wheat" is but an Egyptian trick. Mr. Ernst's Caraccas experience, which was recently given in European periodicals, can be accounted for in other ways than on the "large vitality" guess which he offers. The strongest case is thought to be the *Glaucium* at the Laurentian mines, where a "new species" turned up from under the buried scoriæ of a thousand years. But we must remember that in countries where they will make you a

hundred species out of our common *Draba verna*, it is hardly necessary to go back so many ages for a new species of *Glaucium*. Many of the countries of Europe have not been as well explored as our own, though so much older, and it is quite as likely that that "species" would be found somewhere within a hundred miles or so, as that it came from seed that had been buried in the earth for hundreds of years.

Near me, a few years ago, a street was being graded, and pure brick clay from six feet below the surface was spread over contiguous ground. Quite a quantity of *Ambrosia artemisiæfolia* appeared on it, and I was asked: "Where did the seed come from if it had not been in the ground for hundreds of years?" The asking of that question does not prove the antiquity of the seed. I thought I would get better proof. I took earth from six inches, one foot, two feet, and four feet beneath the surface, and put each lot in separate glass jars of water. After a long and careful stirring, the mud was allowed to settle. The vegetable remains formed the upper course, the clay being the heaviest sinking to the bottom. The results were interesting in many respects, but I may say briefly that there was no sign of any seed whatever after getting one foot below the surface, and at six inches most of the remains were but the mere shells of dead seeds.

I am satisfied that if those who think seeds are "in the ground" waiting a chance to grow, especially such large seeds as oaks, pines, hazel nuts, and so forth, will try this easy and simple plan, they will not take "where do the trees come from?" to mean that the seeds have been for a long time in the ground. In former papers, in other places, I have shown where the plants often do come from; but it is not necessary to repeat those observations now.—THOMAS MEEHAN.

"*Whence the Seeds?*"—An important incident is narrated in the Plattsburg Republican of Sept. 1st, 1877, by Mr. O. S. Phelps of Essex county, N. Y., which has such a direct bearing upon the answer to the question proposed by Mr. Coleman in his communication to the January number of the GAZETTE, that it seems worthy of repetition. Though Mr. Phelps makes no claim to botanical knowledge he is a close and intelligent observer of nature. The incident came under his own observation and is substantially thus:

Many years ago the timber was cleared from a piece of land and a log fence was built along one side of this clearing. In a little time raspberry plants (*Rubus strigosus*) made their appearance along this fence and gradually increased in numbers till a continuous hedge of them skirted its entire length. But the clearing was neglected and in a few years a second crop of trees and shrubs had sprung up, which soon overtopped the raspberries and "*run them out;*" in other words, destroyed them by depriving them of the necessary sunlight. Twenty-five years passed away and this second crop of timber was cut, the land was again cleared, burned over and planted. Behold what followed! At midsummer a dense crop of young raspberry shoots had sprung up all along the line of the old log fence, marking its former position and showing every crook and turn in its direction. Whence the seeds? Evidently they had been dropped there by the old hedge-row of a quarter of a century before, and had lain there buried under fallen leaves and decaying vegetable matter, waiting for the quickening influences of the sun's rays to call their latent powers into activity and cause them to germinate and grow.—CHAS. H. PECK.

"*Where do the seeds come from?*"—The probability is, that in most cases, the wind and animals are the transporters of the seed. The blue-jay is particularly active in storing seeds in and about trees and rocks. Wood-chucks and squirrels are also industrious workers in this line. The agency of insects should not be overlooked; ants are generous providers and keep their graneries well filled. Of course all this transportation is not accomplished without much waste by the way-side, and even the store

houses themselves may overflow, or be broken into and their contents scattered. That one kind of plant should supersede another, or that one kind should grow so vigorously as to choke out all others, is merely an illustration of the "survival of the fittest." —Mrs. J. M. Milligan.

Some large Walnuts.—In the Gazette I see notes occasionally of unusually large growths. The following may be of interest in this connection. A small *Juglans nigra*, about six inches in diameter and about twenty feet high, bore three pecks of fruit, which average near 11½ inches in circumference, and 10¾ ounces in weight. The tree grows in a field, and has no unusual appearance, except the fruit, which looks more like that of the Osage Orange.—Dr. J. Schneck, *Mt. Carmel, Ill.*

The Range of the common Huckelberry in Missouri.—The common huckelberry is not found north of a certain N. E. and S. W. line. Its northern extension is a follows: I have found it on Cuivre bluffs near Troy, Lincoln Co.; also in the northwest part of St. Charles county; on Missouri bluffs as far west as Jefferson City; near Versailles in Morgan county; at Clinton, in Henry county; and in Jasper county; thence it passes southwestward. It is invariably found on either flinty or sandy soil, or where there is but little soil. It abounds chiefly in the pine region of South-eastern Missouri. —Prof. G. C. Broadhead.

Some new stations.—The neighboring county of Clark bids fair to equal Jefferson in the number of its good plants. When it is thoroughly worked up we hope to be able to report many rare things, but those enumerated below are worthy of special mention. While doing some field work last May with one of the College classes, Mr. Chas. R. Barnes called my attention to an odd little Crucifer clinging to the edges of some shaly limestone bluffs. The plant seemed to have suppressed every other part for the benefit of its enormons pods, which were more than half as long as all the rest, and a much more noticeable object than the inconspicuous lyrate root leaves. The little stranger proved to be *Leavenworthia Michauxii*, Torr., growing there in sufficient abundance to satisfy the rapacity of even a botanist possessed of the mania for exchanging. Within a few miles of the above, later in the season, Mr. John F. Baird, collected some fine specimens of *Sullivantia Ohionis*, T. & G., and reported that it was growing in greater abundance even than at Clifty Falls, the habitat of specimens that are to be found in very many of the herbaria of the land. Of course it was growing upon damp limestone cliffs, sending its roots down into the soft, spongy moss. Mr. Baird also collected specimens of *Cleome pungens*, Willd., that to all appearances were perfectly naturalized.—J. M. C.

Botanical Excursions, No. 1, by J. G. Lemmon.—The Great Basin.—The great basin of America is the bed of the evaporated Mediterranean sea of the western continent. Situated on the same parallels as its Eastern prototype, bordered like that on all sides with high ranges of mountains, it differs from it in two particulars, which render the one a very salt sea and the other a very salty desert.

The Mediterranean sea fills a deep chasm in the earth's crust 2,000 to 6,000 feet deep; lying between 30 deg. and 46 deg. north lat., and almost constantly swept by the dry winds of the great Sahara, its waters are evaporated at an immense rate, which would, ages ago, have emptied its basin but for the other important fact, the Strait of Gibraltar, through which a strong current ever comes from the ocean; and this, in addition to the mighty rivers which empty into the sea, and all to restore the equilibrium disturbed by evaporation. To this evaporation—this lifting of a sea into the air—is Europe indebted, mainly, for its exceeding fertility. The dry South wind is a sponge which takes up the waters of the Mediterranean and, condensed by the cold summits of the mountains of Europe, showers its waters over the plains. To this fact also is due the intense saltiness of the Mediterranean, for salt is the residuum of evaporation.

The Mediterranean desert of America is elevated about 5,000 feet above the ocean, so its waters would naturally sink in the earth. Then there are no mighty rivers feeding it, much less a Gibraltar strait, bringing in a flood from a neighboring ocean.

The towering rim of mountains on the West prevents the moist winds of the Pacific from entering the basin; the lofty Eastern rim bars out the Gulf winds; the lower North and South rims admit only the hot, dry, South winds of the Colorado to sweep over the basin, absorbing at their founts the few meager springs that rise at the mountain borders; so we have an immense frying pan or bake oven, as if scooped out of the highest mountains of North America.

It is oblong-elliptical in shape. Its western end rests upon the snow-clad Sierra, the eastern upon the lofty Wasatch range—a spur of the Rocky Mountains. On its smooth bottom are ranged, side by side, steep ranges of mountains running north and south, like cross-bars of a gridiron. The highest of these, the Humboldt range, divides the basin exactly in the center, and the short rivers running from the mountains on all sides form sinks or salt lakes in each end, to which numerous systems of hot springs add alkali, sulphur and other minerals, so that the sinks are generally extremely offensive.

The most important rivers of the eastern depression are Bear river, on the north, and Sevier on the south, each emptying respectively into Great Salt Lake and Lake Sevier. The rivers of the west end are Humboldt and Susan on the north, debouching respectively into Humboldt sink and Honey lake; and Walker, Carson and Truckee on the south, filling respectively Walker, Carson and Pyramid lakes—the latter of which we propose to visit.

And now, dear readers, you must allow me the privilege of walking, to gather and study the plants by the way. See here, before getting out of Sierra valley, what beautiful specimens of the four new *Astragali*, viz: *A. Lemmoni*, *A. Pulsiferæ*, *A. Webberi* and *A.* (unnamed), each particularly abundant along the bottom and sides of Beckworth pass, as if the seeds were sown here by the water current surging through here ages ago.

FLORA OF THE GREAT BASIN.

Emerging through this cleft in the high Sierra, and coming into full view of the shimmering basin below, with the snow-tipped Humboldts in the distance, I will leave you to contemplate the scene, while I pick up this desert plumb, *Prunus Andersoni*, this worm bush *Sarcobatus vermiculatus*, the first of the desert plants met with on the down grade.

Here on the floor of the basin, radiant with beauty, grows the only plant Dr. Gray will allow named for him on the western continent, *Grayia polygaloides*. It is a bush two to five feet high, densely crowded with spikes of flat circular pods, half as large as five cent coins and red as cherries; "neat but not gaudy," is the Doctor's apt description.

A large part of the flora of the basin belongs to the order of *Chenopods*, or the goose-foot family, distinguished by their thick, hairy, succulent leaves, often shiny stems, and the extreme loneliness of the entire order, with the exception of the *Grayia* mentioned. The order most numerous is the one everywhere most abundant, found on every spot where vascular plants may thrive, the immense order of *Compositæ*, or sunflowers. This order comprises about 10,000 species, and forms, according to Humboldt, one-ninth of all the flowering plants of the globe and one-half of its tropical flora.

Chief among this order in the basin is the renowned "sage brush," a name loosely applied to several kinds of plants having the same ashen hue, and found on the great arid plains from the forest-clothed slopes of the Sierra to the bottom lands of the Missouri.

Whatever the order or genus, all is modified to conform to the requisites of this hot region; thick leaves to hold the moisture when the sun is high; copious, non-conducting hairs, to prevent exhalation; sharp, forbidding spines, to ward off enemies of the animal kingdom. This spinescent character is most puzzling to the reflecting mind. What need of such protection in a region so desolate, so unfrequented? The rich open prairies and forests of other lands invite population. This arid, seemingly waterless basin is clothed, except where bleak alkali and salt deserts prevail, with dense, thorny, almost impassable sage brush, as if to guard a priceless treasure. And Darwin says it is so. He affirms that here are reservoirs of elements now unfit for use, which the art of the coming man will turn into verdant forests or beautiful fields, as the needs of a teeming population will demand. Corroborative of this theory, most wonderful vegetable growths are now seen in the valley of the Jordan, tilled by the devoted Mormon, and in the valley of the Carson, verdant with alfalfa; both of these valleys immensely changed in value as the result of irrigation skillfully applied on a large scale. But I must hurry up or you will leave me pondering here in the sand.

The first of the valleys between the cross-bars of the gridiron is Long valley, threaded in winter and spring by Long Valley creek, rising near Reno and running north to Honey lake. Passing down it 25 miles we turn eastward through a cattle range enclosed by a fence of matted willows, climb the first ridge and Soda Lake valley is before us. The lake is a yellow pool of salt, alkali and sulphur. Crossing to the second ridge and climbing it, we look over into Winnemucca valley. On the pass at our feet is a beautiful *Scutellaria nana* (Gray), a new species. It maintains its green, robust look by means of reservoirs of plant food stored in its thick, necklace-like, subterranean stems. The next is Warm Spring valley, quite large and important. Through it passes the road from Reno to Surprise valley and Fort Bidwell. Passing around a sand mountain, gemmed with rare *Œnotheras*, we ascend an arm of Warm Spring valley, move over a high pass and drop into a valley so walled in with sheltering ridges as to afford a surprisingly large and varied flora.

Every mile of our progress to this point has been marked by decreasing verdure and the appearance of the peculiar ashen, dwarfed, desert plants. But here in this little valley all the species met with on the way are crowded, while hosts of strangers appear. In rapture, I named it for the veteran botanist,

GRAY'S VALLEY.

Here in this secluded garden of the great basin is the natural home of the sand and sun-loving plants, too numerous to name—all putting on their gayest apparel and exhaling the richest perfumes, as if to prove the oft-quoted lines:

> Full many a flower is born to blush unseen
> And waste its sweetness on the desert air.

Here flourishes *Tetradymia spinosa*, with strong, hooked prickles; the monster *Thelpodium*, four to six feet high. Up on the hot sand bluffs stands, sentry-like, the scrubby crucifer *Stanleya pinnatifida*, with spikes of yellow flowers 18 inches long, terminating upright; white limbs four to six feet high. On the clean sand by our feet nestles the curious *Coldenia nuttallii*, the purple *Conanthus aretioides*, the yellow *Emmeranthe glandulifera*, the snake-head like *Anisocoma acaule* and several species of the ever beautiful *Œnotheras*; but most striking of all uprears the rare *Abronia Crux-Maltæ* of Dr. Kellogg, holding at arm's length its large balls of pink flowers. Over the dry water-course, *Cleome lutea* peers; from the rocks on each hand hang *Pentstemons* and *Arenarias*, while the gorgeous *Eschscholtzia* shows its red eyes between the clefts, and the immortal *Lewisia rediviva* on the gravel above aspires to notice by creeping to the edge of the precipice.

This plant is well named *rediviva*. Roots gathered nearly two years ago are growing still in their papers despite heavy pressure, illustrating the power with which they

are endowed to resist the severities of the basin climate. Deep rooted in the volcanic ashes of yonder bench glows *Opuntia pulchella*, the prettiest of the *Cacti* family, and that odd little stiff-leaved, crimson *Oxytheca perfoliata*. Under the spiny bushes of *Bigelovia graveolens* carpeting the whole valley, are seen a few plants of *Pectocarrya penicillata* strayed away from the coast, and *Blitum carinatum*, only found before in Australia.

RECENT PUBLICATIONS.—*American Journal of Science and Arts*, January. Dr. Gray gives a review of Darwin's late work on "The Different Forms of Flowers on Plants of the same Species." This paper came to hand most aptly just as we had finished reading the book. Dr. Gray, of course, does not mention that the work was dedicated to him, but so it is, and we are glad of it, for it is a deserved compliment. It was refreshing to see all through the book the notice that was taken of American botanists, for it is a sign that they are not all completely absored in Systematic Botany, which, in a country comparatively new, very justly has a controlling interest, but are beginning to study life histories. Dr. Gray adds another genus and natural order to the list of cleistogamous flowers. Mr. C. G. Pringle, of Charlotte, Vermont, has found excellent examples of cleistogamous flowers in *Dalibarda repens*, of the order *Rosaceæ*. Mr. Pringle also announces the discovery of cleistogamous flowers regularly occurring within the leaf-sheaths of *Danthonia spicata* and its allies, also in *Vilfa* and other grasses. Mr. Darwin adopts Hildebrand's term of *heterostyled*, instead of *heterogone* or *heterogonous* suggested by Dr. Gray. The first six chapters "relate to di-morphous blossoms, such as those of Primrose and *Houstonia*, including also the trimorphic cases, as of *Lythrum Salicaria* and some species of *Oxalis*. The seventh chapter discusses Polygamous, Dicecious, and Gyno-Dicecious Plants; the eighth and closing chapter is devoted to Cleistogamous Flowers."

American Naturalist, January.—The botanical notes are "Notes on the Alpine Flora of Mt. Shasta," and "Production of Apples in 'off' Years," both by Dr. A. S. Packard. The Naturalist comes for the first time from Phildelphia, from the press of McCalla & Staveley. The press work is as fine if not finer than ever, and under the editorial management of Dr. A. S. Packard, Jr., and Prof. E. D. Cope, it promises to its patrons everything needed in a journal devoted to Natural Sciences. In looking over the different departments, we see them all in the hands of specialists except Botany. It is hard, even for a journal devoted to natural sciences in their widest sense, not to become special in its tendency. It would require wonderful skill and self-denial for two such eminet Zoologists as Dr. Packard and Prof. Cope not to throw the weight of their favor on the side of Zoology. We are not decrying Zoology, for next to Botany it has a warmer place in our affections than anything else, but we are asking for a fair representation.

Bulletin of the Torrey Botanical Club, November, December and January.—The November number is filled by a contribution from Francis Wolle. He gives a list of Fresh Water Algæ, the work of the past twelve months. It contains 150 forms new to the United States and 24 new to science. Two new genera also are described. In the December No. a new species of *Danthonia* is described by C. F. Austin, and named for its discoverer, *D. Faxoni*. The species is allied to *D. spicata*, and was found at the Notch of the White Mts., N. H. Mr. Davenport describes a new *Cheilanthes* found in California, and names it *C. viscida*. The species seems intermediate between *C. vestita* and *C. Cooperæ* and will be figured in an early number of the "Illustrations of the Ferns of North America." In the January number we note Mr. Geo. E. Davenport's valuable contriution on "Vernation in Botrychia, with special reference to its importance as a means for distinguishing the different species." The different species of *Botrychium* have so long been puzzles to botanists that Mr. Davenport has tried to

establish them upon characters that would be unmistakable and invariable. He has found these characters in the buds and spores. As the characters depending on the spores can be determined only by very high microscopical power, in the present paper he describes the buds. An accompanying plate, with figures drawn by M J. H. Emerton, renders the descriptions very plain and easy to follow. With this number the Bulletin began its ninth year of publication, and we wish it long life and success. It consists of four or more pages monthly. The price is one dollar per annum, in advance. Address Wm. A. Leggett, 54 East 81st Street, N. Y. City

Science Observer, January.—This journal is printed at Boston by the Boston Amateur Society. Its subscription price is fifty cents per annum. It consists of eight pages and a cover. Address Science Observer, Box 2,725, Boston.

The Gardener's Monthly, January.—We are always at a loss what to note in this journal. It is so full of facts, that to select one would seem to slight others. Of course the part pertaining strictly to gardeners we can legitimately pass over, as it does not belong to our province. But botanists too, have a corner, and a good large one, for Mr. Thos. Meehan is a scientific botanist as his frequent contributions to the Proceedings of the Phila. Acad. of Nat. Sci., will show.

The Valley Naturalist, January.—The first number of this monthly is before us. It is published at St. Louis, Mo., by Henry Skaer, 1,213 South 6th St. The subscription price is fifty cents per annum, and its object is to aid the diffusion of natural science in a popular form. The present number has its departments of Entomology, Botany, Ornithology and Conchology well represented.

Botanical Index, January.—Published by L. B. Case at Richmond, Ind. With the number before us the Index begins its second year of existence. It contains 12 pages or more of matter devoted to Floriculture and Horticulture. It is well illustrated and certainly deserves the patronage of all amateur gardeners or florists. The subscription price of the Index is 50 cents per year.

Silurian Plants, by Leo Lesquereux.—Read before the American Phil. Soc., Oct. 19, 1877. The author describes in this paper five new species of land plants recently discovered in the Silurian rocks of the United States, one of them belonging to a new genus. "The discovery, an important one for the Natural History of this country, was recorded in the Am. Jour. of Science and Arts, Jan. 1874, p. 31, and the remains, representing two fragments of stems and branches, were briefly described at the same time." Now for the first time the plants are fully described. A branch of a fern has been recently obtained from the Silurian Schists or Slates of Angers, France, but this important discovery of land plants in the Silurian was forestalled in America. "It is a remarkable fact that the character of these Silurian plants gives us a microcosmical representation of the flora of the Carboniferons, so simple and at the same time so admirable in the multiple sub-divisions of its specific forms." We now have represented in the Silurian the *Lycopodiaceæ*; the Ferns; the *Calamariæ*, representing Cryptogamous acrogens like the ferns; the *Sigillariæ*, or representatives of the Phænogamous gymnosperm. "When *Cordaites* (now considered Conifers) are found in Silurian beds (a probable discovery, for they have been found abundant in the Devonian,) we shall have all the essential types of the plants of the Carboniferous flora already represented in the oldest paleozoic times." Mr. Lesquereux also describes a fungus found in the shales of the Darlington Coal bed at Cannelton, Penn "This discovery" the author remarks, "is not less remarkable than that of land plants in the Silurian."